

US EPA ARCHIVE DOCUMENT

United States Environmental Protection Agency – Region 5

Determination of No Further Action

The Former Graphite Products Corporation (now Milcam Corp.)
OHD 004201406

Introduction

This document for the former the Former Graphite Products Co. (currently Milcam Co.) located at 5756 Warren Sharron Road, Brookfield, OH 44403 and hereinafter referred to as “GPC or the facility” explains the basis for the United States Environmental Protection Agency’s (EPA’s) determination that no further action is required for this Facility. This document summarizes information that can be found in greater detail in the Administrative Record for this facility including these specific files from the EPA Region 5 Records Center:

- A.2 Part A / Interim Status
- A.3.4 Annual Monitoring Report
- A.3.5 Operation and Maintenance/CME
- A.4.1 - A.4.5 Correspondence / Financial
- A.4.2- Closure Plan
- C.2 Compliance and Enforcement
- C.3 Enforcement Confidential
- D.1.4 Preliminary Assessment / VSI

EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the facility and the RCRA activities that have been conducted there.

Determination

EPA has made a determination that no further action by the Federal RCRA corrective action program is required at the former GPC Facility at this time. The conditions currently found at GPC do not pose an unacceptable risk to human health or the environment.

Facility Background

The former GPC facility is located at 5756 Warren-Sharon Road, about 2.5 miles west of the town of Brookfield, Brookfield Township, Trumbull County. GPC has 193 feet of frontage on Warren-Sharon Road and has a size of approximately 3.6 acres in area. The GPC Plant Building consisted of process and storage facilities for the blending of various industrial lubricants. The plant was built in 1953, and since then has blended a variety of lubricating products such as metalworking lubricants, high performance lubricants, parting compounds and release agents, friction reducing dry-film lubricants, electrically conductive lubricants and coatings, and friction

modifying additives.

The area surrounding the site is primarily rural with single family homes and farms within the immediate area. GPC operated at this location from 1953 to 1996.

GPC operated as an EPA interim status facility, and because it operated an open surface impoundment for storing and treating outwash waters from GPC processes, it was listed in EPA records as a treatment storage and disposal (TSD) facility, liable for corrective action under Section 3008h of RCRA. The last file information pertinent to the closure of the GPC site was August 1996, and after approval of the closure process of the required unit, the property was sold by GPC and acquired by Milcam, a general construction contractor company generating no hazardous waste.

Waste Generation and Waste Management History

US EPA, utilizing the Technical Enforcement Support (TES) IV Contract, conducted a Preliminary Review/Visual Site Inspection- RCRA Facility Assessment (PR/VSI-RFA) on GPC. The Preliminary Assessment/Visual Site Inspection (PA/VSI) identified three (3) Solid Waste Management Units (SWMUs) and two (2) Areas of Concern (AOCs). These SWMUs and AOCs were identified as follows:

SWMU 1 A surface impoundment (unpermitted, which operated under interim status) surrounded by an earthen clay dike and lined with native clay for the entire history of its use. Until 1984, the diked surface impoundment (hereafter referred to as the impoundment) was used by GPC for collecting wash waters from plant floor drains. Since 1953, the impoundment generally received 750-800 gallons of plant wash water per month up until 1985. These wash waters were generally composed of:

- 1) Highly diluted chemicals used to make GPC products, such as 1,1,1 TCA, xylene, ethylbenzene, toluene, and lead that was washed into floor drains leading to the impoundment.
- 2) Contaminated water/detergent rinse from the cleaning of dispersion blending equipment, containing largely diluted amounts of the same chemicals described above.

Due to the contaminants possibly contained in the wash waters, SWMU 1 became the focus of the investigation for closure and any required corrective action, based on the fact that there were no known or documented releases from any of the other SWMUs or AOCs. From 1985 – 1996, closure activities were prepared, commenced and completed on the impoundment as well as the installation of a groundwater well network to ascertain groundwater involvement and these activities are summarized in the “Phase II - Soil Sampling and Excavation”, and “Phase III – Groundwater Monitoring Program” sections of this document.

SWMU 2 – This unit consisted of a 1000 gallon above ground storage tank (used for the storage of wastewaters from floor drain wastes before sending them to the surface impoundment (SWMU 1) above. No releases were ever known or recorded, and at the time of the PA/VSI the tank contents were analyzed and found not to be hazardous, by a licensed waste hauler contracted with GPC. The tank was supported by pillars mounted on a diked concrete pad underlain with eight inches of sand and a poly-propylene liner. The PA/VSI identified this SWMU as having a low likelihood of a release having occurred, and no further actions were recommended for SWMU2.

SWMU 3 – This unit consisted of a 30 gallon Stoddard solvent tank housed in the GPC plant and used for cleaning machine parts. This SWMU operated for a short period of time, from 1988 to 1989 and was housed on the concrete floor, and an independent contractor replenishes and maintains the tank, and hauls away the used Stoddard solvent on a monthly basis. No releases were recorded or noted to have occurred. The PA/VSI also identified this SWMU as having a low likelihood of a release having occurred, and no further actions were recommended for SWMU3.

AOC 1 – This area of concern contained the “aeration sewage treatment plant”. This area handled plant sanitary sewage, and no hazardous materials were treated, stored or generated in this area. The plant exists to this day and is operated and maintained by a service contractor, Mack Industries. No RCRA hazardous wastes were stored, treated or disposed at this AOC. The RFA identified this AOC as having a low likelihood of a release having occurred, and no further actions were recommended for AOC1.

AOC 2 – This area of concern contained above ground storage tanks of raw materials used to manufacture GPC products. This AOC was non-RCRA regulated. The tanks were positioned in the same diked concrete pad described in SWMU 2, underlain by eight inches of sand and a polypropylene liner. Milcam removed these tanks, as well as the concrete pad, sand and the liner and the SWMU2 holding tank. Milcam representatives stated that the sand was clean and dry when the concrete pad was removed. No spills were ever noted or recorded, and there was no evidence of a release from AOC2. The RFA also identified this AOC as having a low likelihood of a release having occurred, and no further actions were recommended for AOC2.

The location of these SWMUs and AOCs are depicted in Figure 1- (Metcalf and Eddy Environmental, Inc.; the Former GPC Facility Diagram).

Hydrogeological Setting

GPC lies within the Glaciated Appellation Plateau physiographic province. The area has been affected by multiple advances of continental ice sheets during the Pleistocene Epoch. GPC is underlain by clayey ground moraine deposits of Tavery Till ranging up to 30 feet in thickness. GPC may be close to a contact between the Pennsylvanian-aged Sharon Conglomerate Member of the Pottsville Formation and a Mississippian-aged bedrock unit thought to be shale in the

Cuyahoga group. There is insufficient information to determine which unit underlies GPC. The poorly drained soils underlying GPC formed a silty glacial till on a nearly level and gently sloping terrain. The soils in this area belong to the Sebring and Rawson Groups and are high in clay content having very low permeability. In a 1977 Ohio EPA study, they determined that Sebring soil, which allows less dissipation than Rawson soil, is present below GPC. The U.S. Geological Survey (USGS) 7.5 minute quadrangle for this area (Sharon West Quadrangle) indicates that surface drainage from GPC is from southward to an intermittent tributary of Little Yankee Run. Trumbull County Health Department records indicate that the area residents are supplied through both private water wells and a local city water source. GPC obtained its water supply from two springs which are located in the western and southwestern portions of the property. Well records for the area show that groundwater is a product of glacial deposits as well as deep bedrock sources. The springs are used for both potable water and process water. During times of low flow from the springs, city water is used at GPC.

Local health department records indicate that the direction of regional groundwater flow is to the south, approximately paralleling the regional dip in the Appellation Basin. Further information from the Health Department indicates that there are approximately three aquifers in the area. The uppermost aquifer is primarily sand and gravel, which is found at a depth of 20-25 feet. It is likely that this aquifer is the source of water for the springs used at GPC. The second aquifer, possibly correlating with the Berea or Cassewago Sandstones is 40-50 feet deep and is most often used as the source of drinking water. The third aquifer is 100-150 feet deep and is interbedded sand and shale. This aquifer possibly correlates with the silty and sandy zones within the Upper Devonian Cleveland Shale.

Ecological Setting

The GPC facility exists within a mixed rural-agricultural-residential area in Trumbull County, Brookfield, Ohio. The facility layout is provided in Figure 1.

Vegetation in and around the GPC facility consists of primarily coarse native grasses that cover most of the undeveloped land, as well as manicured grasses of residential properties, and farms producing various crops. No endangered species are known or observed to inhabit the local area.

Investigations

Phase I – Dewatering Surface Impoundment

The initial phase of closure activities was undertaken by Keystone Environmental, Inc., an environmental engineering company from Monroeville, PA. After initial approval of the closure plan by Ohio EPA and US EPA in 1998, Phase I began, and consisted of dewatering the impoundment followed by sludge and soil excavation from 1987 through 1989. Following the gross removal of impoundment liquor and sludge, hazardous waste determinations were made on the materials. The sludge and waters removed were tested to make a waste determination on the materials and the materials found to be hazardous were transported by a licensed waste

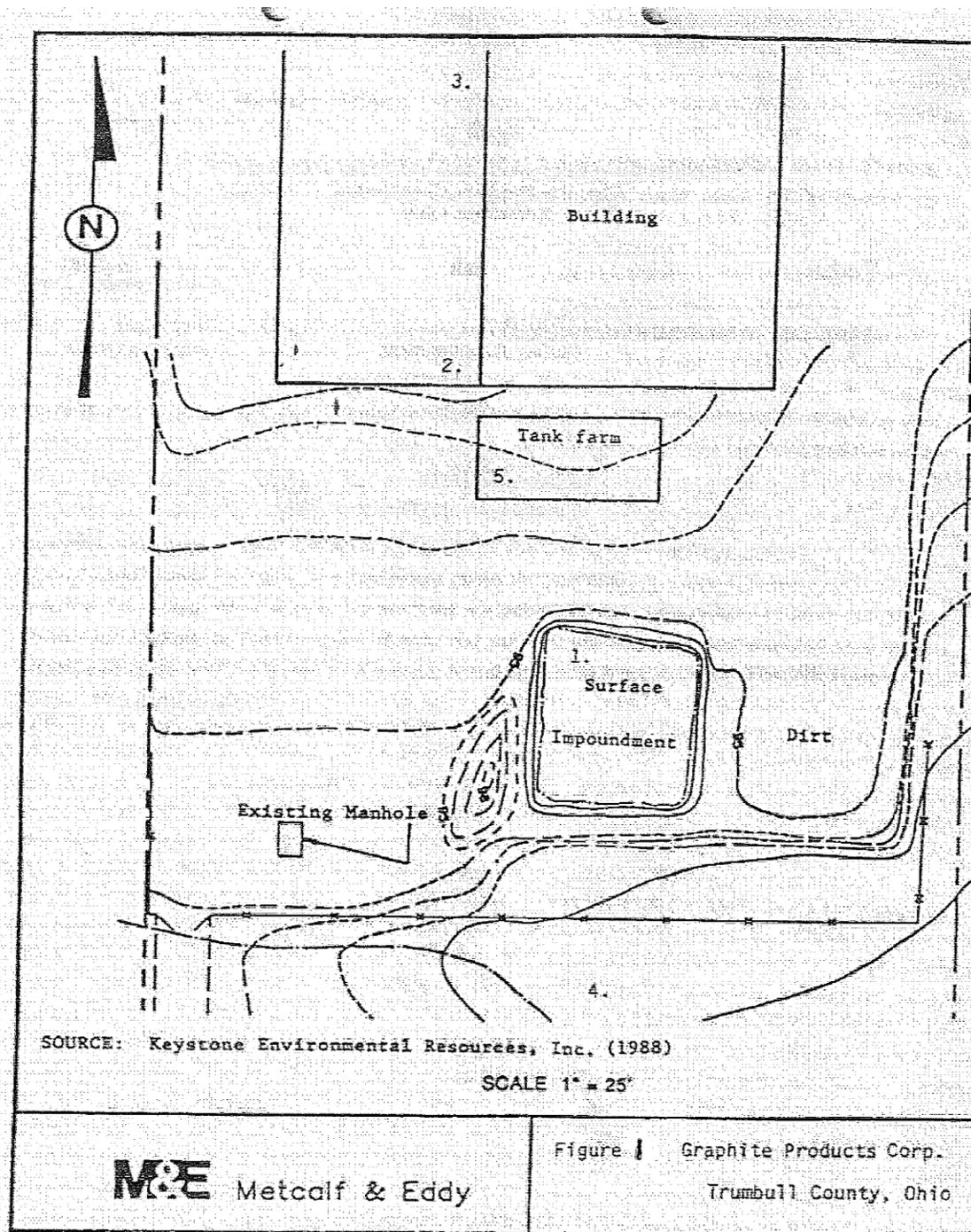
transporter to a permitted hazardous waste disposal facility.

Phase II - Soil Sampling and Excavation -

Phase II soil excavation activities consisted of removal of soil from the bottom and sides of the diked surface impoundment. Sampling of areas beyond the diked surface impoundment was conducted and installation of a monitoring well network for groundwater analysis and post closure monitoring was installed.

Figure 1 - Facility Diagram

Facility Diagram - The Former Graphite Products Corp.



For Phase II, GPC used these cleanup goals in its plan for soil sampling and excavation of contaminated soil from the diked surface impoundment and the area surrounding it:

Lead (Pb) in soil

The soil removal and sampling in Phase II adopted 39 mg/kg as the non site-specific background level for lead, as based on Ohio regulations for backgrounds of contaminants in Ohio farm soils.

Organic contaminants in soil

For organic contaminants, using this same Ohio farm soils standard, GPC used these cleanup goals in its plan for Phase II soil sampling and excavation from the impoundment (SWMU 1).

1,1,1 Trichloroethane (TCA)	1 mg/kg
Acetone	2 mg /kg
1,1 Dichloroethene	1 mg/kg
Total Xylenes	1 mg/kg
Ethylbenzene	1 mg/kg
1,1 Dichloroethane	1 mg/kg

The Phase II activities began with the sampling and identification of compounds of concern in surface impoundment soils, and excavation to remove them, up to 24” in depth. Samples were taken from all sides and the bottom of the impoundment at 6 inch intervals, to identify the depth and lateral nature and extent of contamination. All removed soils were first submitted for a waste determination to decide if the soils were considered hazardous or not. Those wastes that were shown to be hazardous were removed by manifest and properly disposed as hazardous waste.

Remaining soils left in place had contaminant concentrations for lead and organic contaminants at or below the non-site specific cleanup goals referenced above, for lead and organic contaminants. The excavations from soil removals in the impoundment were filled with clean soil.

Soil analysis outside the surface impoundment:

Five (5) soils outside and surrounding the diked impoundment (SWMU 1) were sampled for lead, and the average of the total lead in the samples was calculated to be 28.83 mg/kg, with the lead values for each external sampling location ranging from 94 mg/kg to 6 mg/kg.

Phase III – Groundwater Monitoring Program

Finally, a groundwater monitoring well network was installed as shown in Figure 2, Monitoring Well Location Map (Keystone Environmental Resources, Inc.) Groundwater at the GPS facility

ran generally from north to south. One background (upgradient) well (R5) was advanced north of the impoundment, and three downgradient wells (R2, R3, R4) were installed to the south. Each 2.5" well with PVC casing was screened such that the top of the screen was level with the first water table encountered when drilling, with coarse sand extending 2 feet around each screen. The coarse sand was topped with a pelletized bentonite seal, and a steel locking protective casing was installed to protect each well from tampering. The wells were individually developed with airlifting, surging or bailing methods to ensure that the water was as turbidity free as possible.

As part of the Closure Plan, GPC was required to conduct four (4) quarters of background groundwater monitoring, followed by six (6) semiannual groundwater monitoring periods. The quarterly process was initiated in December, 1991.

Groundwater was sampled from the GPC network from wells R2 – R5 from December 1991 on a quarterly basis through September 1992 for a total of four (4) quarterly measurements. Prior to each sampling event, depth to water and the total depth of the wells were measured. The quality assurance project plan and sampling plans for the groundwater sampling and analysis as well as the laboratory protocols to analyze the water samples is provided in record A.3.4, Annual Monitoring Report in the Federal file for post closure monitoring of GPC.

Tables 1 – 6 of this document show the results of the groundwater testing at GPC. All values for site contaminants of concern were at or below EPA Maximum Contamination limits for that time for each contaminant. Monitoring well R5 is the upgradient monitoring well and was chosen as the background well. Monitoring well R1 was never used during the project, and the reason is not readily known and not described in the file records.

Scope of Corrective Action

EPA believes that with the completion of soil removal and groundwater analysis, no known areas of soil or groundwater contamination remain at the facility. No further investigation, cleanup, institutional controls or long term monitoring is required at the former GPC site.

At the present time, Milcam Co., an architectural design and general contracting firm owns the property and does not handle hazardous wastes.

CONCLUSION

Based upon the information presented in this document and in the Administrative Record regarding releases and remedial actions performed at this Site to address those releases, EPA has determined that no further action by the federal RCRA corrective action program is necessary at GPC at this time. The site conditions were assessed against the objectives for eliminating threats from a site named above and EPA believes that the management of the site has met those

objectives. After review of the efforts undertaken at the site by GPC and confirmed by the sampling conducted by Metcalf and Eddy, Keystone Environmental and Geraghty & Miller, EPA believes that the cleanup of the site was effective and met the three performance standards listed above.

Since soils in and around the surface impoundment and groundwater were found to be below regulatory limits for known contaminants linked to the operations of GPC, and since the site is now used by architectural and general contracting/building company which does not generate, store, treat or dispose of hazardous wastes, U.S. EPA recommends no further action at the GPC facility.

Figure 2 – GPC Groundwater Monitoring Well Network

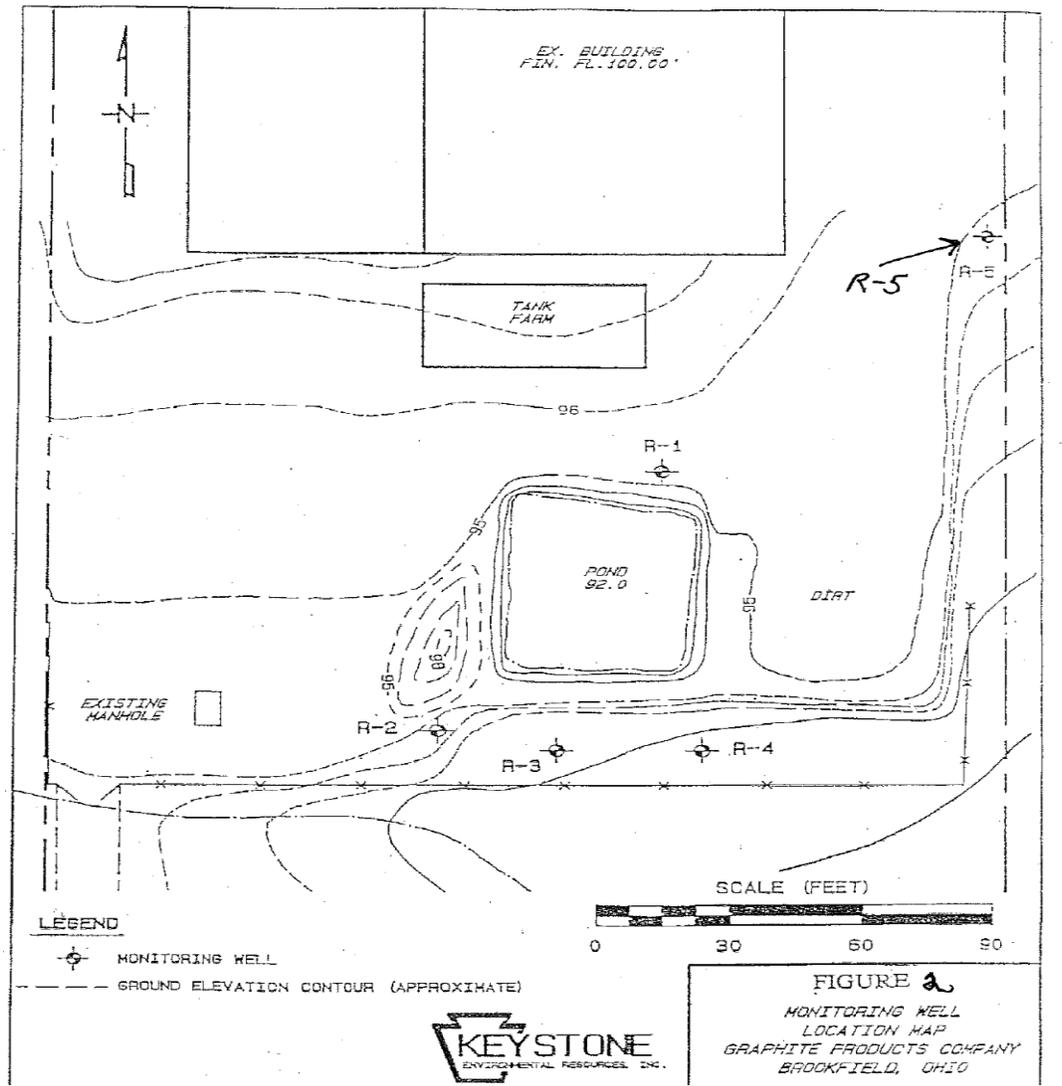


Table 1 – Analytical Parameters for GPC Groundwater Sampling Events

ANALYTICAL PARAMETERS
GRAPHITE PRODUCTS CORPORATION
BROOKFIELD, OHIO

Drinking Water Supply Criteria

Arsenic
Barium
Cadmium
Chromium
Fluoride
Lead
Mercury
Nitrate (as N)
Selenium
Silver
Endrin
Lindane
Methoxychlor
Toxaphene
2,4-D
2,4,5-TP Silver
Radium
Gross Alpha
Gross Beta
Turbidity
Coliform Bacteria

Groundwater Quality Parameters

Chloride
Iron
Manganese
Phenols
Sodium
Sulfate

Groundwater Indicator Parameters

pH
Specific Conductance
Total Organic Carbon (TOC)
Total Organic Halogen (TOX)

Table 1 (cont'd) – Analytical Parameters for GPC Groundwater Sampling Events

ANALYTICAL PARAMETERS
 GRAPHITE PRODUCTS CORPORATION
 BROOKFIELD, OHIO

Constituents of Concern

1,1,1-Trichloroethane
 1,1-Dichloroethene
 Acetone
 Total Xylenes
 Ethylbenzene
 1,1-Dichloroethane
 Toluene

Table 2 – Summary of Groundwater Elevations, Wells R2 –R5

WELL	TOP OF CASING (feet)	EFFECTIVE DATE	GROUND-WATER ELEVATIONS (feet)
R-2	96.93	12/05/91	91.70
	96.93	03/12/92	92.07
	96.93	06/04/92	91.25
	96.93	09/30/92	91.65
R-3	96.12	12/05/91	91.66
	96.12	03/12/92	92.02
	96.12	06/04/92	91.20
	96.12	09/30/92	91.62
R-4	95.08	12/05/91	91.65
	95.08	03/12/92	92.00
	95.08	06/04/92	91.19
	95.08	09/30/92	91.60
R-5	99.27	12/05/91	93.40
	99.27	03/12/92	93.79
	99.27	06/04/92	92.91
	99.27	09/30/92	93.34

Tables 3-6 Summary of Groundwater Monitoring Wells R-2 through R-5

Table 3
Summary of Ground-Water Quality Results/Well R-2
Graphite Products Corp.
Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Drinking Water Supply Criteria						
2,4,5-TP	ppb		ND<0.100	ND<0.100	ND<0.110	ND<0.020
2,4-D	ppb		ND<0.500	ND<0.500	ND<1.100	ND<0.200
Silver	ppb		N/A	ND<10.000	ND<10.000	ND<5.000
Alpha emission, total	pCi/l		ND<3.000	ND<3.000	8	ND<3.000
Arsenic	ppb		ND<5.000	ND<5.000	ND<10.000	ND<5.000
Barium	ppb		160	150	ND<200	188
Beta emission, total	pCi/l		ND<4.000	ND<4.000	12	ND<4.000
Cadmium	ppb		ND<20.000	ND<10.000	ND<5.000	ND<1.000
Coliform, total	#/100 ml		ND<1.000	ND<1.000	ND<1.000	Positive
Chromium	ppb		ND<20.000	ND<20.000	ND<10.000	ND<10.000
Endrin	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.050
Fluoride	ppm		0.2	0.1	ND<1.000	0.2
Mercury	ppb		ND<5.000	ND<5.000	ND<0.200	ND<0.200
Lindane	ppb		ND<0.050	ND<0.050	ND<0.050	ND<0.020
Methoxychlor, total	ppb		ND<0.500	ND<0.500	ND<0.500	ND<0.030
Nitrate	ppm N		ND<0.100	ND<0.100	ND<0.010	0.1
Lead	ppb		ND<100	ND<100	ND<3.000	ND<2.000
Radium 226	pCi/l		ND<1.000	ND<1.000	ND<0.600	N/A
Radium 228	pCi/l		ND<1.000	1	ND<1.000	N/A
Radium, Total	pCi/l		N/A	N/A	N/A	ND<1.000
Selenium	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toxaphene, total	ppb		ND<1.000	ND<1.000	ND<1.000	ND<0.100
Turbidity	ntu		19	5.7	8.5	113
Ground Water Quality Parameters						
Chloride	ppm		58	61	59	48.1
Iron	ppb		340	330	ND<100	ND<40.000
Manganese	ppb		200	230	230	214
Sodium	ppm		21	20	24	22.8
Phenols	ppm		0.09	ND<0.010	ND<0.005	ND<0.010
Sulfate	ppm		59	59	59	52.1

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Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 3 (cont.)
 Summary of Ground-Water Quality Results/Well R-2
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Ground Water Indicator Parameters						
Specific Conductivity	umhos/cm	a	400	490	580	506
Specific Conductivity	umhos/cm	b	389	500	590	506
Specific Conductivity	umhos/cm	c	382	500	580	506
Specific Conductivity	umhos/cm	d	380	500	590	506
pH	SU	a	6.93	6.91	7.43	7.4
pH	SU	b	6.94	7.16	7.39	7.4
pH	SU	c	6.99	7.28	7.39	7.4
pH	SU	d	7.01	7.34	7.38	7.4
Total Organic Carbon	ppm	a	ND<1.000	ND<1.000	ND<1.000	2.1
Total Organic Carbon	ppm	b	N/A	ND<1.000	ND<1.000	1.6
Total Organic Carbon	ppm	c	N/A	ND<1.000	ND<1.000	1.5
Total Organic Carbon	ppm	d	N/A	ND<1.000	ND<1.000	1.4
Total Organic Halogens	ppb	a	22	47	ND<50.000	ND<5.000
Total Organic Halogens	ppb	b	N/A	30	ND<50.000	ND<5.000
Total Organic Halogens	ppb	c	N/A	40	ND<50.000	ND<5.000
Total Organic Halogens	ppb	d	N/A	25	ND<50.000	ND<5.000
Constituents of Concern						
Acetone	ppb		ND<50.000	ND<50.000	ND<50.000	ND<100
Ethylbenzene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toluene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Ethylbenzene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1,1-Trichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000

Notes:

ND<5.0 - Constituent not detected at the concentration shown.

N/A - Not analyzed.

Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 4
 Summary of Ground-Water Quality Results/Well R-3
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Drinking Water Supply Criteria						
2,4,5-TP	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.020
2,4-D	ppb		ND<0.500	ND<0.500	ND<1.000	ND<0.200
Silver	ppb		N/A	ND<10.000	ND<10.000	ND<5.000
Alpha emission, total	pCi/l		ND<3.000	ND<3.000	15	ND<3.000
Arsenic	ppb	6	ND<5.000	ND<5.000	ND<10.000	ND<5.000
Barium	ppb	100	120	ND<200		114
Beta emission, total	pCi/l		ND<4.000	4	35	5
Cadmium	ppb		ND<10.000	ND<10.000	ND<5.000	ND<1.000
Coliform, total	#/100 ml		ND<1.000	ND<1.000	ND<1.000	Positive
Chromium	ppb		ND<20.000	ND<20.000	ND<10.000	ND<10.000
Endrin	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.050
Fluoride	ppm	0.2	0.2	ND<1.000		0.22
Mercury	ppb		ND<5.000	ND<5.000	ND<0.200	0.2
Lindane	ppb		ND<0.050	ND<0.050	ND<0.050	ND<0.020
Methoxychlor, total	ppb		ND<0.500	ND<0.500	ND<0.500	ND<0.030
Nitrate	ppm N		ND<0.100	ND<0.100	ND<0.010	0.08
Lead	ppb		ND<100	ND<100	ND<3.000	ND<2.000
Radium 226	pCi/l		ND<1.000	ND<1.000	ND<0.600	N/A
Radium 228	pCi/l		ND<1.000	2	ND<1.000	N/A
Radium, Total	pCi/l		N/A	N/A	N/A	2
Selenium	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toxaphene, total	ppb		ND<1.000	ND<1.000	ND<1.000	ND<0.100
Turbidity	ntu		5.4	5.9	25	185
Ground Water Quality Parameters						
Chloride	ppm		72	71	72	59.9
Manganese	ppb		180	210	210	193
Sodium	ppm		27	27	30	28.7
Phenols	ppm		0.04	ND<0.010	ND<0.005	ND<0.010
Sulfate	ppm		69	63	58	58
Iron	ppb		380	320	ND<100	ND<40.000

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Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 4 (cont.)
 Summary of Ground-Water Quality Results/Well R-3
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Ground Water Indicator Parameters						
pH	SU	a	7.23	7.03	7.26	7.5
pH	SU	b	7.08	7.13	7.36	7.5
pH	SU	c	6.93	7.26	7.33	7.5
pH	SU	d	7.21	7.46	7.35	7.5
Specific Conductivity	umhos/cm	a	449	550	600	552
Specific Conductivity	umhos/cm	b	440	550	600	552
Specific Conductivity	umhos/cm	c	442	520	610	552
Specific Conductivity	umhos/cm	d	430	520	590	552
Total Organic Carbon	ppm	a	ND<1.000	ND<1.000	ND<1.000	1.5
Total Organic Carbon	ppm	b	N/A	ND<1.000	ND<1.000	2.1
Total Organic Carbon	ppm	c	N/A	ND<1.000	ND<1.000	1.4
Total Organic Carbon	ppm	d	N/A	ND<1.000	ND<1.000	1.8
Total Organic Halogens	ppb	a	17	50	ND<50.000	ND<5.000
Total Organic Halogens	ppb	b	N/A	93	ND<50.000	ND<5.000
Total Organic Halogens	ppb	c	N/A	50	ND<50.000	ND<5.000
Total Organic Halogens	ppb	d	N/A	93	ND<50.000	ND<5.000
Constituents of Concern						
Acetone	ppb		ND<50.000	ND<50.000	ND<50.000	ND<100
Ethylbenzene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1,1-Trichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toluene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Xylene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<10.000

Notes:

ND<5.0 - Constituent not detected at the concentration shown.

N/A - Not analyzed.

Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 5
 Summary of Ground-Water Quality Results/Well R-4
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Drinking Water Supply Criteria						
2,4,5-TP	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.020
2,4-D	ppb		ND<0.500	ND<0.500	ND<1.000	ND<0.200
Silver	ppb		N/A	ND<10.000	ND<10.000	ND<5.000
Alpha emission, total	pCi/l		ND<3.000	ND<3.000	37	4
Arsenic	ppb	7		6	ND<10.000	6.7
Barium	ppb	110		110	ND<200	137
Beta emission, total	pCi/l	5		4	128	6
Cadmium	ppb		ND<10.000	ND<10.000	ND<5.000	ND<1.000
Coliform, total	#/100 ml		ND<1.000	ND<1.000	ND<1.000	Positive
Chromium	ppb		ND<20.000	ND<20.000	ND<10.000	ND<10.000
Endrin	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.050
Fluoride	ppm	0.2		0.2	ND<1.000	0.21
Mercury	ppb		ND<5.000	ND<5.000	ND<0.200	ND<0.200
Lindane	ppb		ND<0.050	ND<0.050	ND<0.050	ND<0.020
Methoxychlor, total	ppb		ND<0.500	ND<0.500	ND<0.500	ND<0.030
Nitrate	ppm N		ND<0.100	ND<0.100	ND<0.010	ND<0.050
Lead	ppb		ND<100	ND<100	ND<3.000	ND<2.000
Radium 226	pCi/l		ND<1.000	ND<1.000	ND<0.600	N/A
Radium 228	pCi/l		ND<1.000	ND<1.000	ND<1.000	N/A
Radium, Total	pCi/l		N/A	N/A	N/A	4
Selenium	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toxaphene, total	ppb		ND<1.000	ND<1.000	ND<1.000	ND<0.100
Turbidity	ntu		15	9.5	16	825
Ground Water Quality Parameters						
Chloride	ppm		85	87	85	68.9
Iron	ppb		380	260	ND<100	127
Manganese	ppb		200	190	300	243
Sodium	ppm		25	20	26	24.9
Phenols	ppm		ND<0.010	ND<0.010	ND<0.005	ND<0.010
Sulfate	ppm		81	72	76	65.2

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Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 5 (cont.)
 Summary of Ground-Water Quality Results/Well R-4
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Ground Water Indicator Parameters						
pH	SU	a	7.17	7.06	7.33	7.4
pH	SU	b	6.9	7.18	7.33	7.4
pH	SU	c	6.99	7.36	7.33	7.4
pH	SU	d	7.23	7.45	7.33	7.4
Specific Conductivity	umhos/cm	a	450	520	650	587
Specific Conductivity	umhos/cm	b	452	520	640	587
Specific Conductivity	umhos/cm	c	442	520	640	587
Specific Conductivity	umhos/cm	d	440	510	650	587
Total Organic Carbon	ppm	a	ND<1.000	ND<1.000	ND<1.000	2.5
Total Organic Carbon	ppm	b		ND<1.000	ND<1.000	1.8
Total Organic Carbon	ppm	c		ND<1.000	ND<1.000	1.1
Total Organic Carbon	ppm	d		ND<1.000	ND<1.000	1.8
Total Organic Halogens	ppb	a	ND<10.000	59	ND<50.000	ND<5.000
Total Organic Halogens	ppb	b		70	ND<50.000	ND<5.000
Total Organic Halogens	ppb	c		32	ND<50.000	ND<5.000
Total Organic Halogens	ppb	d		32	ND<50.000	13
Constituents of Concern						
1,1,1-Trichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Acetone	ppb		ND<50.000	ND<50.000	ND<50.000	ND<100
Ethylbenzene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toluene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Xylene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<10.000

Notes:

ND<5.0 - Constituent not detected at the concentration shown.

N/A - Not analyzed

Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 6
Summary of Ground-Water Quality Results/Well R-5
Graphite Products Corp.
Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Drinking Water Supply Criteria						
2,4,5-TP	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.020
2,4-D	ppb		ND<0.500	ND<0.500	ND<1.000	ND<0.200
Silver	ppb		N/A	ND<10.000	ND<10.000	ND<5.000
Alpha emission, total	pCi/l		ND<3.000	ND<3.000	52	ND<3.000
Arsenic	ppb		20	10	21	17
Barium	ppb		60	70	ND<200	64
Beta emission, total	pCi/l		6	ND<4.000	104	ND<4.000
Cadmium	ppb		ND<10.000	ND<10.000	ND<5.000	ND<1.000
Coliform, total	#/100 ml		ND<1.000	ND<1.000	ND<1.000	Positive
Chromium	ppb		ND<20.000	ND<20.000	ND<10.000	ND<10.000
Endrin	ppb		ND<0.100	ND<0.100	ND<0.100	ND<0.050
Fluoride	ppm		0.2	0.2	ND<1.000	0.23
Mercury	ppb		ND<5.000	ND<5.000	ND<0.200	ND<0.200
Lindane	ppb		ND<0.050	ND<0.050	ND<0.050	ND<0.020
Methoxychlor, total	ppb		ND<0.500	ND<0.500	ND<0.500	ND<0.030
Nitrate	ppm N		ND<0.100	ND<0.100	ND<0.010	ND<0.050
Lead	ppb		ND<100	ND<100	ND<3.000	ND<2.000
Radium 226	pCi/l		ND<1.000	ND<1.000	ND<0.600	N/A
Radium 228	pCi/l		ND<1.000	ND<1.000	ND<1.000	N/A
Radium, Total	pCi/l		N/A	N/A	N/A	1
Selenium	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toxaphene, total	ppb		ND<1.000	ND<1.000	ND<1.000	ND<0.100
Turbidity	ntu		63	22	15	155
Ground Water Quality Parameters						
Chloride	ppm		84	80	79	59
Iron	ppb		460	510	ND<100	ND<40.000
Manganese	ppb		180	190	210	205
Sodium	ppm		27	25	30	28.9
Phenols	ppm		0.06	ND<0.010	ND<0.005	ND<0.010
Sulfate	ppm		110	100	110	89

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Tables 3-6 (cont'd) Summary of Groundwater Monitoring Wells R-2 through R-5

Table 6 (cont.)
 Summary of Ground-Water Quality Results/Well R-5
 Graphite Products Corp.
 Brookfield, OH

PARAMETER	UNITS	REPLICATE	12/05/91	03/12/92	06/04/92	09/30/92
Ground Water Indicator Parameters						
pH	SU	a	7.15	7.16	7.4	7.5
pH	SU	b	7.13	7.18	7.39	7.5
pH	SU	c	7.19	7.39	7.4	7.5
pH	SU	d	7.18	7.44	7.4	7.5
Specific Conductivity	umhos/cm	a	520	680	720	587
Specific Conductivity	umhos/cm	b	510	650	730	587
Specific Conductivity	umhos/cm	c	510	620	720	587
Specific Conductivity	umhos/cm	d	510	620	720	587
Total Organic Carbon	ppm	a	ND<1.000	ND<1.000	1.1	1.8
Total Organic Carbon	ppm	b	N/A	ND<1.000	1.1	1.3
Total Organic Carbon	ppm	c	N/A	ND<1.000	1.1	1.8
Total Organic Carbon	ppm	d	N/A	ND<1.000	1.2	1.3
Total Organic Halogens	ppb	a	16	66	ND<50.000	ND<5.000
Total Organic Halogens	ppb	b	N/A	53	ND<50.000	ND<5.000
Total Organic Halogens	ppb	c	N/A	42	ND<50.000	ND<5.000
Total Organic Halogens	ppb	d	N/A	57	ND<50.000	ND<5.000
Constituents of Concern						
1,1,1-Trichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
1,1-Dichloroethane	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Acetone	ppb		ND<50.000	ND<50.000	ND<50.000	ND<100
Ethylbenzene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Toluene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<5.000
Xylene	ppb		ND<5.000	ND<5.000	ND<5.000	ND<10.000

Notes:

ND<5.0 - Constituent not detected at the concentration shown.

N/A - Not analyzed